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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/609,392	KIM, HYEON JUN
	Examiner	Art Unit
	Scott L Luedke	2697

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-26 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more Claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

1. Claims 4-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation of "confidence," which is located in each of Claims 4-12, does not have a sufficient antecedent basis for this limitation in the claim. There is no previous recitation of a "confidence" in Claims 4-12 or in their parent claim, Claim 1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1-4, 6, 10, 11 and 23-26 are rejected under 35 U.S.C. 102(b) as being anticipated by *Kim*, U.S. Patent # 6,445,818 (hereinafter, denoted as "*Kim*").

In general, *Kim* discloses a region dominant color extraction system for designating a local representative color value on a color image. The design of the system includes, but is not limited to, the capability of automatically selecting: (1) the most proper search algorithm in an

image searching system and (2) a search algorithm in a content base image searching system utilizing a characteristic weight (Col. 3, Lines 17-24).

To better understand the substantial similarities between the *Kim* reference and the features recited in independent Claim 1, the *Kim* reference discloses the use of an extraction unit and a histogram in essentially the same manner as recited in Claims 1-6, 10, 11 and 23-26.

As recited in Claim 1, a region dominant color is "expressed by a number of dominant colors with respect to a certain region." The *Kim* reference (Figure 3) describes this method, wherein an extraction unit (Item 107) is used and a color histogram is built (Item 107a) for each block of a color image (Item 107b) and a maximum value of the histogram are designated as a representative color value of its block (Item 107c). More specifically, the extraction unit (Item 107) in *Kim*, includes a global histogram data module (Item 107a), which has the color information of an overall image, a local representative color data module (Item 107b) having the color information of each blocks, and a major color region data module (Item 107c) having the color information of a region (Col. 6, Lines 7-13).

Additionally, the region dominant color descriptor as recited in Claim 1 includes an "expressed dominant color." The *Kim* reference (Figure 2B, Block S52) discloses the use of an expressed dominant color, via the creation of a histogram for each block of the color (discussed supra). Each histogram contains a plurality of information about its respective block, which includes but is not limited to, a maximum value, which (expressly) represents the color value of the block (Col. 4, Lines 30-33).

Next, the region dominant color descriptor in Claim 1 considers the "*frequency* that the dominant color appears and the *accuracy* of a color value that represents the region" to

determine the proper representation in certain regions of an image (emphasis added). Regarding the frequency factor in more detail, the Applicant's disclosure at Page 6, Lines 17-21, states that a frequency condition description "define[s] the threshold value of the frequency in which the frequency below the threshold value is not considered, a sorting order threshold value in which the dominant colors are set with respect to a few number among the frequencies which appear n most frequently, and the sum of the frequencies as threshold value, which appear n most frequently." The search algorithm as described in the *Kim* reference, (Figure 4, described at Column 6, Lines 23-37 and Block S104 of Fig. 5) also determines the frequency that the dominant color appears as recited in Claim 1 by first, scanning through a reference image to detect the number of color blocks that contain color information within that reference image. This detection method compares the number of color blocks found within that reference image with a predetermined first reference value. During this detection process, the search algorithm keeps track of the number of blocks that have color information within that reference image (i.e., the frequency that the dominant color appears) and uses that information when calculating the weight allotment for each respective block within the image.

A final element, as recited in the claim set, provides for an "accuracy of a color value" that "the region" of interest. The Applicant's disclosure (Pg. 7, Lines. 20-23) describes the degree of *accuracy* of the region dominant color as to enhance a search performance and implement compatibility among the region dominant colors, which are extracted by different extraction methods, is expressed by the *confidence* measure. To better understand the claimed element regarding the "degree of accuracy" disclosed in Claim 1, it is necessary to analyze the meaning of "confidence measure" as it is described in the Applicant's disclosure. The Applicant

discloses at Page 7, Line 24 through Page 8, Line 7 that the confidence measure is determined by all *or part of* factors such as a NADCA (Not Apparently Distinguishable Color Allowance), a coherency value, a CME (Color Mapping Error), the size of the region covered by the dominant color in the image region and the position of the color pixels in the region. Since the accuracy of the region dominant color in Claim 1 is expressed by the confidence measure, it becomes necessary to first analyze the confidence measure as it is defined in the Applicant's disclosure. Thus, the following discussion encompasses each of the factors used in defining the confidence measure as they are described in the Applicant's disclosure.

Accordingly, the application of a NADCA (Not Apparently Distinguishable Color Allowance) is a factor that might be considered when determining the confidence measure. At Page 7, Line 25 through Page 8, Line 1, of the Applicant's disclosure, the NADCA is defined as "a maximum variance that any two colors are recognizable as the same color." Here, the *Kim* reference discloses a similar method of determining when any two colors within the same block are deemed indistinguishable. *Kim* describes a method in which, a given block that contains any two colors that are beneath a certain, pre-determined threshold value, is placed with a "don't care" designation. More specifically, once it is determined that the maximum color value for the given group is less than the color value of the block that it is referenced with, a "don't care" designation is placed upon a block.

Next, the determination of a coherency value is a second factor that might be considered when determining the confidence measure. At Page 8, Lines 1-3 of the Applicant's disclosure, the coherency value is defined as to "measures whether or not the pixels of the colors are gathered with respect to the color given." The *Kim* reference also discloses the method of

establishing a value for a given block that is indicative of and/or a representation that denotes the grouping/distribution of pixels within that given block. As depicted in *Kim* (Fig. 1E), a local color histogram is created for each block of the image, which is used to thereby designate a more effective representative color value visually or sensually (Col. 4, Line 67 through Col. 5, Line 2). Furthermore, the value(s) represented via the color histogram for each respective block may also used to measure whether or not the pixels of the colors are gathered with respect to the color given for that block.

As mentioned infra, the determination of a "CME (Color Mapping Error)" is a third factor potentially considered when determining the confidence measure. At Page 8, Lines 3-7 of the Applicant's disclosure, states that the CME is "related to an error between all color values mapping to the dominant color and the dominant color value (i.e., CME is the property of the color variance of the colors clustering a dominant color)." Similarly, the *Kim* reference also discloses a similar method of mapping as in the Applicant's disclosure. At Col. 5, Lines 3-17, the *Kim* reference describes the creation of special histograms (i.e., hue group histograms) by gathering information from various blocks surrounding and/or clustering the block of interest. More specifically, the creation of these special histograms (depicted as Block S21 of Fig.2B) are obtained from the adjacent blocks by mapping similar color groups and may be used to represent mapping to the dominant color and the dominant color value.

Lastly, the determination of the "size of the region covered by the dominant color in the image region and the position of the color pixels in the region," is a fourth factor that is considered when determining the confidence measure. Similarly, the *Kim* reference in Figs. 2A-2C, Step 53 as described at Col. 4, Lines 47-52, a determination is made whether the

representative color value designation is completed for the overall image (i.e. whether a representative color value has been designated for the last block of the image) and repeating the steps of building a more accurate, local color histogram for each block, until the representative color value is designated for the last block. The color value for each block is ultimately a representation of many factors, including but not limited to, the size of the region covered by the dominant color in the image region and the position of the color pixels in the region.

The *Kim* reference further describes that once a maximum color value from each local color histogram is selected, its selected value is compared with a predetermined reference value. If the maximum color value is greater than the predetermined reference value, then the value is designated as the maximum color value, thereby becoming the representative color value for the entire corresponding block (Col. 4, Lines 28-43). If the maximum color group value is less than the second reference value, the system attains a distribution rate of the color group from the color histogram of each block, then an appropriate weight of values more than a given threshold in the distribution rate is adjusted and distributed, thereby becoming the representative color value for the corresponding block (Col. 3, Lines 51-58). This process will continue until a dominant color is obtained, which is used to represent the entire region and/or block within the color image. This dominant color value for each block ultimately represents many factors, including but not limited to, the size of the region covered by the dominant color in the image region and the position of the color pixels in the region.

The previous discussion shows that the *Kim* reference discloses all the factors potentially used in determining the confidence measure as claimed by the Applicant. In addition, since the region dominant color is expressed by the confidence measure, it follows that the "accuracy of a

color value representing the region" element as recited in Claim 1, is also fully described in the *Kim* reference.

Regarding Claims 2 and 10, the *Kim* reference also discloses the interoperability between different feature extraction methods, including the method of comparing and searching two region dominant color descriptors by transforming data formed by another dominant color descriptor extraction method into a different system. *Kim*, at Col. 3, Line 39-42 describes a method wherein a color image area is divided into two or more blocks of a constant size and their maximum values (as designated by their respective histograms), then compared, and assigned and/or re-assigned a maximum value deemed to represent the color value for each respective block.

As described in *Kim*, this method inherently transforms data that was once formed by another dominant color descriptor extraction method into a different system because a unique and/or different algorithm may be used to compare each of the blocks (i.e., two or more at any one time). Once these two or more unique blocks are compared via the use of different algorithms (i.e., different dominant color descriptor extraction methods), a new value is established and assigned to one or more of the blocks, therein showing an interoperability between different feature extraction methods as recited in Claims 2 and 10. For the above reasons, Claims 2 and 10 recite substantially the same limitations as addressed with respect to Claims 1, 3-4, 6 and 11 and the same remarks apply.

Claim 3 features the expression of accuracy of the dominant colors as extracted by a certain method in accordance with a degree of confidence of the region dominant color descriptor. As discussed in the remarks under Claim 1 above involving expressing accuracy, a

variety of factors may be applied in determining the accuracy (and in subsequently expressing it) in accordance with a degree of confidence of the region dominant color descriptor. Since the expressing of the accuracy relies upon the method in which the accuracy is established (i.e., application of many factors), it follows that the discussed in the remarks for Claim 1 above are also applicable in rejecting this Claim as well.

Regarding Claim 4, the limitation that includes the method of recognizing an increase/decrease of the color expressed by a certain value as the same color is also a method that is described in Kim at Col. 3, Line 39-42, wherein it describes a method wherein a color image area is divided into two or more blocks of a constant size and their maximum values (as designated by their respective histograms), then compared, and assigned and/or re-assigned a maximum value deemed to represent the color value for each respective block. If after the comparison, it is determined that the value as assigned to the region falls within a pre-determined range and/or threshold (as calculated via the confidence as disclosed in the remarks for Claims 1-3), then the same color will be designated to represent the region.

Regarding Claim 6, a coherency value is used to represent the concentration degree of the pixels of a color with respect to the dominant color is adapted to the confidence. As discussed in the remarks for Claim 1, the use of a coherency value in this manner is described in the *Kim* reference. Additionally, the Kim reference as stated in the remarks for Claim 1 discloses a method of adapting a factor, such as a coherency value, to the confidence measure of the region.

In claim 11, the additional feature includes using the accurate value of the color and the dominant color value and adapt it to the confidence. As discussed infra under Claims 1 and 3, the Kim reference describes each factor may be applied in determining the accuracy (and in

subsequently expressing it) in accordance with a degree of confidence of the region dominant color descriptor. Since the expressing of the accuracy relies upon the method in which the accuracy is established (i.e., application of many factors), it follows that the discussed in the remarks for Claim 1 and 3 above are also applicable in rejecting this Claim as well.

Regarding Claim 23, a video region dominant color setting method is recited to include the extracting of a region, setting a dominant color descriptor with respect to a certain region, storing a region descriptor with respect to the region dominant color descriptor and a set dominant color to represent that extracted region. Referring to Figure 2B in step S20, the *Kim* reference discloses a method of extracting a hue group from the color histograms that is used to represent a block of interest and the maximum value from the extracted values is designated as a representative color value for the block (Col. 4, Lines 55-59). As mentioned infra regarding Claim 1, once a histogram is established for a certain block, the algorithm in *Kim* continuously gathers and compares information from all other region descriptors and/or histograms within the same dominant color region and updates the original block with respect to that newly gathered information. Moreover, *Kim* describes the local color histogram (e.g., dominant color descriptor) with respect to region of interest, to inherently also store this information (i.e., region descriptor) with respect to the region dominant color descriptor. In addition, these features are described in the Kim reference as stated in the remarks under Claim 1. It follows that the same remarks under Claim 1 referring to these features also apply in rejecting this Claim in conjunction with the discussion above.

Claim 24 contains features that are substantially similar to those stated in Claim 23 with exception to the "comparing all stored other region descriptors with a dominant color." It is

described in *Kim*, at Col. 3, Line 39-42 describes a method wherein a color image area is divided into two or more blocks of a constant size and their maximum values (as designated by their respective histograms), then compared, and assigned and/or re-assigned a maximum value deemed to represent the color value for each respective block. Furthermore, since Claim 10 includes the method of comparing each confidence value that is obtained by different region dominant color feature extraction methods as similarly featured in this Claim. it follows that the same remarks for rejection infra for Claim 10 apply to this Claim as well.

The limitation as recited in Claim 25 that is not present in Claim 24 is the method of transforming and searching a sharing data format using a region descriptor of each system. However this additional feature/limitation of transforming and searching is described in the Kim reference and is rejected using the same rationales as stated in the remarks for Claim 2 above.

Claim 26 recites the use of the frequency that the dominant color appears in the region and the use of a confidence measure of the color of the region to describe the amount of reliability should be given to the dominant colors in the given region. Since the recitation of the term "reliability" in this Claim is applied in substantially the same way the term "accuracy" is recited and applied in Claim 1. both terms are deemed synonymous with each other. Also, the use of, and applicability of, the limitation: "frequency that the dominant color appears" is also substantially the same limitation as addressed with respect to Claim 1 above, and therefore the same remarks apply.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the Claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 5, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kim*, as applied to Claims 1-6, 10, 11 and 23-26 as stated infra, in view of *Graham*, Boyd, et. al., U.S. Patent # 5,222,154 (hereinafter, denoted as "*Graham*").

The *Kim* reference discloses most of the features as recited in Claim 5, but lacks full disclosure of mapping a certain color as a "dominant color in an image region, color variance which is a difference between an accurate value of the color and the dominant color value is adapted to the confidence." However, when considering what is taught in *Kim*, as explained in the rejections for Claims 1-4, 6, 10, 11 and 23-26 above, in view of the teachings found in *Graham*, it becomes obvious to one skilled in the art at the time of the invention to combine them. More specifically, *Graham* teaches at Col. 5, Lines 59-64 a method of "finding the

dominant colors is accomplished by creating 'clusters' of colors that are related. This is done by taking the maximum occurrence and finding the colors around that maximum occurrence that are related and including the related colors in the color cluster." As discussed under Claims 1-4 above, the *Kim* reference teaches a color extraction method, in which various factors are adapted to the confidence of a region of interest. Therefore, even though Kim fails to disclose adapting the mapping (i.e., color clustering) a certain color in an image region, it does describe the method of adapting a variety of tools and/or factors that are applicable in adapting the confidence of a region. Additionally, the *Graham* reference does describe a method as recited in this Claim of creating and using a clustering method (e.g., mapping) of colors. It follows that it would have been obvious to the person of ordinary skill in the art at the time of the invention was made to combine these references to map a certain color as a "dominant color in an image region, color variance which is a difference between an accurate value of the color and the dominant color value is adapted to the confidence."

The *Kim* reference discloses most of the features as recited in Claim 7, but lacks full disclosure of a "*size of the region* that a dominant color covers in the image region is adapted to the confidence" (emphasis added). However, when considering what is taught in *Kim*, as explained in the rejections for Claims 1-4, 6, 10, 11 and 23-26 above, in view of the teachings found in *Graham*, it becomes obvious to one skilled in the art at the time of the invention to combine them. More specifically, *Graham* teaches a color extraction method, in which "the width and the height in pixels (or the number of pixels horizontally and the number of lines) describe the dimensions of the image in pixels" (Column 4, Lines 66-69). The spot color extraction system in *Graham* discloses that by "using well known techniques, the user is

permitted to select an area which he may want to perform the spot color extraction on. Alternatively, the entire prescanned spot image may be selected" (Col. 6, Lines 30-34). Therefore in general, the *Kim* reference teaches the method of adapting the confidence to a region, but lacks full description of how to determine the size of the region as recited in Claim 7. However, the *Graham* reference teaches a method of replacing the similar colors that are captured in color images and/or image pixels (via clustering methods) and replaces them with a single dominant color. Additionally, the size of the region covered is determined via the clustering methods as described therein.

Not only would it have been obvious to the person of ordinary skill in the art at the time of the invention was made to combine these references, but also the motivation to combine and/or modify these references is apparent when considering the reasons to follow. The *Kim* reference discloses a system and method of the gathering data from a given area of interest and applying that information to create a degree of confidence to represent that area of interest. The *Graham* reference discloses a system and method of selecting a certain number of pixels to establish an area or region (e.g., size) of interest within a given image. If gathering data from a given area of interest and applying that information to create a degree of confidence as recited in *Kim*, was combined with a method that allows the user to select an area which he may want to perform the color extraction as recited in *Graham*, then it follows that the region size of the image will also become adaptable to the confidence value for that region. Therefore, such a combination would have been obvious when the size of the region that a dominant color covers in the image region is adapted to the confidence is the objective.

The *Kim* reference discloses most of the features as recited in Claim 8, but lacks full disclosure of "a *position of each color pixel* in the image region is adapted to the confidence" (emphasis added). However, when considering what is taught in *Kim*, as explained in the rejections for Claims 1-6, 10, 11 and 23-26 above, in view of the teachings found in *Graham*, it becomes obvious to one skilled in the art at the time of the invention to combine them. More specifically, in the Abstract at Lines 9-19, *Graham* teaches a color extraction system and method wherein each line of an original image is first scanned in the system and is subsequently processed to determine where within each line, a different color exist. The locations of the different colors are noted and segments of each line are correlated with each other and with segments of adjacent lines to determine if the noted colors are in similar locations to identify areas of color that represent the original image.

In general, the *Kim* reference teaches the method of adapting the confidence to a region, but lacks full description of how to determine the position of each color pixel in the image region as recited in Claim 7. However, the *Graham* reference teaches a method of selecting a position or location of a color pixel if interest within a region or area of interest replacing the similar colors that are captured in color images and/or image pixels (via clustering methods) and replaces them with a single dominant color.

Therefore, in addition to the reasoning as stated above, a person of ordinary skill in the art at the time the invention was made to combine the teachings of *Graham* (wherein it teaches selecting a position or location of a color pixel if interest within a region or area of interest), with *Kim* (wherein it teaches the application of gathering data from a given area of interest and applying that information to create a degree of confidence to represent that area of interest).

4. Claims 9 and 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Kim* in view of *Graham* as applied to Claims 1-8, 10-11 and 23-26 as stated infra, and further in view of *Lienhart*. Wernicke, et. al., U.S. Patent # 6,473,522 (hereinafter, denoted as "*Lienhart*").

The *Kim* reference discloses most of the features as recited in Claim 9 and 12, but lacks full disclosure of expressing a confidence measure by a "vector" and calculating the confidence measure by "an *average value* with respect to a difference when a certain color is recognized as a dominant color" and an "*average value* in a region of each color pixel" (emphasis added). However, when considering what is taught in *Kim*, in view of the teachings found in *Graham* as explained in the rejections for Claims 1-8, 10-11 and 23-26 above and in further view of the teachings found in *Lienhart*, it becomes obvious to one skilled in the art at the time of the invention to combine them.

More specifically, the *Kim* reference in view of *Graham* (see remarks for Claims 7 and 8) discloses most of the features as recited, but lacks full disclosure of expressing the confidence measure of the region dominant color descriptor by a "vector." However, the *Lienhart* reference discloses a vector quantizing method, in which an image is divided into certain colors and a difference color histogram is created that reflects the differences in value between the divided color blocks (Abstract, Lines 2-14). The method also employs a best displacement search, in which only pixels having a color within a threshold of an estimated color are considered. The best displacement search as described in *Lienhart* therefore discloses the same method as

claimed in Claim 9 because its vector quantizing search method recognizes different dominant color values when compared with other pixels in the same image block.

Next, even though the *Kim* reference lacks full disclosure of "an *average value* with respect to a difference when a certain color is recognized as a dominant color" and an "*average value* in a region of each color pixel," the *Graham* reference describes a method of comparing various spatial areas with the pallet of colors and an average noted color of the spatial areas are replaced with the closest corresponding pallet color (Abstract, Lines 19-22)(emphasis added). In addition, after understanding that the *Graham* reference in general describes method(s) involving the extraction of color pixels as stated previously, at Col. 9, Lines 7-10 of the reference, it states that the system combines all matched areas (via a mapping method) and that "the average color of the combined areas are compared to the pallet colors and the closest color is set for each area (referring to Fig. 9, Step 1016). It follows therefore, that when combining the *Kim* reference in view of *Graham*, it becomes obvious to one skilled in the art at the time of the invention to combine them, resulting in a color extracting system that finds an average value with respect to a difference when a certain color is recognized as a dominant color within a region of each color pixel.

In addition, not only would it have been obvious to the person of ordinary skill in the art at the time of the invention was made to combine the references applied in rejecting Claims 7 and 8 (see remarks infra) with what is taught in *Lienhart*, but also the motivation to combine and/or modify these references is apparent when considering the following. As previously discussed, the *Lienhart* reference discloses a vector quantizing method, which is substantially similar to the quantization method of the color space (expressed by a quantization description) as

presently claimed. Further, since *Lienhart* shows a system and method of utilizing vector quantizing in an extraction method for region dominant color description in a more accurate and efficient manner, the system and method is in fact, analogous to the teachings as related to the prior art.

5. Regarding Claims 13-22, the *Kim* reference discloses most of the features as recited in Claim 13, but lacks full disclosure of a color space description, a color sub-space descriptor, a quantization method of the color space or a color cluster description. However, when considering what is taught in *Kim*, as recited in the remarks regarding Claims 1-12 and 23-26 above, in view of the teachings found in *Graham* and *Lienhart*, it becomes obvious to one skilled in the art at the time of the invention to combine them.

Regarding these additional features, the Applicant's disclosure states that the color space description "defines reference color space which is a reference of a dominant color and a transformation description from a reference color space to define the transformation from a well known color space to the adopted color space, wherein the transformation description defines the number of color channels of the reference color space and a transformation type and method (Page 6, Lines 22 through Page 7, Line 1). The Applicant's disclosure states that the quantization description "defines the number of quantized channels and the quantized color channels, the quantization method and the number of the quantization levels for each channel and a method used for a quantization transformation" (Page 7, Lines 7-10). To define the color clustering description, the Applicant's disclosure states that this description "defines whether the cluster is used or not, and whether or not the number of clustering is varied in accordance with

the region. the number of the clusters and the color channels used in the clustering and the method to describe each cluster" (Page 7, Lines 11-14).

Using different terminology to disclose each of these features as recited in Claims 13-22, the *Lienhart* reference discloses the use of a data structure that also utilizes a substantially similar color clustering system in a substantially similar way that includes the additional limitations.

Per Claim 13, the quantization description for describing a quantization method of the color space is described in Lienhart. Additionally, the method including defining a color cluster dewscription is also described in Lienhart as discussed in the following. First, the quantization method and the mapping system (or a "clustering system" as presently claimed) disclosed in *Lienhart*, includes a text color histogram (or a "transformation description" as presently claimed) in which defines the number of color channels of the reference color space and a transformation type and method in a substantially similar manner. *Lienhart* discloses the use of the text color histogram to provide for a "measure of the amount of the quantized colors that includes data in a bounding box," in which assists color distribution for each bounding box by quantizing the colors to a predetermined number of dominating colors (Col. 11, Lines 4-9). Additionally, the text color histogram as disclosed in *Lienhart* provides for a measure of the amount of the quantized colors included in portions of other parts of the image of interest and a difference histogram is used to calculate the difference between the text and background histograms (Col. 11, Lines 29-31).

Claim 14 includes the data structure is described in a header of a memory and is re-defined whenever a corresponding item is changed. Similarly as disclosed in Graham Col. 11,

Lines 59-64, a path within the data structure used can be empty, real, possible or terminated and at any time prior to output of the spot color extracted image, additional processing may be done. Therefore, a data structure as in *Graham* can also be re-defined at any time prior to output of the color-extracted image.

Claim 16 recites the region dominant color value to include the feature of applying a filter size defining that the filter is adapted to the image entire region, and a sliding method with respect to a filter window. Similarly as disclosed in *Lienhart* in the Abstract, Lines 19-23, it is disclosed that some embodiments of the invention also include receiving digital images in text bounding boxes and in preparation for a segmentation process, adjusting sizes of the digital images to a fixed height. It follows that a substantially similar method of using a filter size and/or a sliding method with respect to a filter window as claimed, is disclosed in Lienhart when employing bounding boxes in which may also adjust sizes of the digital sizes.

The features as recited in Claims 15 and 17 have been discussed under Claim rejection remarks for Claims 1, 2 and 10, infra. The use of a data structure as recited in these Claims does not invalidate a proper rejection since Lienhart discloses the use of a data structure in the described color extraction method.

Regarding Claims 18-20, the system and method of measuring the amount of quantized colors (via a histogram) and calculating the difference between different regions of the images (e.g., background vs. text) is disclosed in the system and method as described in *Lienhart*. The *Lienhart* system and method is substantially similar to the claimed method of determining the number of quantized color channels and the quantized color channels. Regarding the color clustering description, the *Graham* reference discloses a system and method for determining

whether a cluster is used or not. whether or not the number of clustering is varied in accordance with the region, the number of the clusters and the color channels used in the clustering and the method to describe each cluster. The *Graham* reference (at Col. 5, Lines 57-64) also describes a substantially similar clustering method, wherein the finding of a pallet of colors using a 3-D histogram and finding the dominant colors by creating a "clusters" of colors that are related. Just as the color clustering description as claimed, the method in *Graham* also monitors clusters in a substantially similar manner as for example at Col. 5, Lines 61-64, *Graham* discloses that the maximum occurrence and the finding of the colors around that maximum occurrence that are related become included with the related colors in that color cluster.

Claim 22 includes an additional limitation that was not discussed in full detail in the rejections above. As this claim's meaning is construed in light of the Applicant's disclosure, it follows that the above remarks associated with Claims 13-21 also apply to this claim in its entirety because its additional limitation includes only a mathematical manipulation of the confidence value with respect to the coherence value and the color pixel. This claimed mathematical manipulation (e.g., multiplying coherence values and dividing confidence values) does not add any additional feature(s) and/or limitation(s) so as to differentiate itself from the rejection rationales as applied to Claims 13-21.

Conclusion

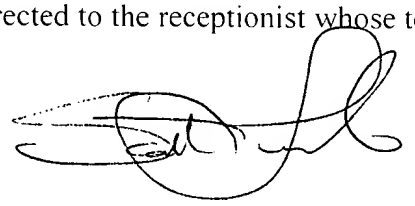
6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Rao, Lin, et. al., (U.S. Patent 5,795,154), which describes an method for generating image quantization matrices, locating frequency coefficient within a transform array,

determining a frequency content for its coefficient and a method for quantizing the transform array with the quantization matrix.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott L. Luedke whose telephone number is 703/305-8327. The examiner can normally be reached Monday through Friday from 9:00 am to 5:30 pm

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Joseph Mancuso can be reached at 703/305-3885. The fax phone number for the organization where this application or proceeding is assigned is 703/746-9429.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703/305-4750.



SLL
January 27, 2003